Year 5 - Science - Unit 2 - Forces

Knowledge I already have

In year 3:
- I compared how things moved on different surfaces.
- I noticed that some forces need contact between two objects, but magnetic forces can act at a distance.
- I observed how magnets attract or repel each other and attract some materials and not others.
- I compared and grouped together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials.
- I described magnets as having two poles and predicted whether two magnets will attract or repel each other, depending on which poles are facing.

Future Knowledge

By the end of KS3, I will:
- Describe forces as pushes or pulls, arising from the interaction between two objects.
- Use force arrows in diagrams, adding forces in one dimension, balanced and unbalanced forces.
- Explain moment as the turning effect of a force.
- Associate forces with deforming objects; stretching and squashing – springs; with rubbing and friction between surfaces, with pushing things out of the way; resistance to motion of air and water.
- Know that forces are measured in Newtons and are measurements of stretch or compression as force is changed.

New Knowledge

During this unit:
- I will learn that a force causes an object to start moving, stop moving, speed up, slow down or change direction.
- I will learn that gravity is a force that acts at a distance. Everything is pulled to the Earth by gravity. This causes unsupported objects to fall.
- I will identify the effects of air resistance, water resistance and friction, that act between moving surfaces.
- I will recognise and demonstrate that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

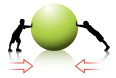
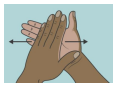
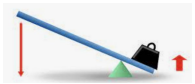
Scientific Enquiry

Comparative and Fair Tests:
- I will investigate and explain the effect of friction in a range of contexts e.g. trainers, bathmats, mats for a helter-skelter.
- Investigate and explain the effects of air resistance in a range of contexts e.g. parachutes, spinners, sails on boats.
- Investigate and explain the effects of water resistance in a range of contexts e.g. dropping shapes through water and pulling shapes along the surface of water.

Research using Secondary Sources:
- I will research how the work of scientists such as Galileo Galilei and Isaac Newton helped to develop the theory of gravitation.

Key Ideas & Vocabulary

A force causes an object to start moving, stop moving, speed up, slow down or change direction. Gravity is a force that acts at a distance. Everything is pulled to the Earth by gravity. This causes unsupported objects to fall. Air resistance, water resistance and friction are contact forces that act between moving surfaces. The object may be moving through the air or water, or the air and water may be moving over a stationary object.
A mechanism is a device that allows a small force to be increased to a larger force. The payback is that it requires a greater movement. The small force moves a long distance and the resulting large force moves a small distance, e.g. a crowbar or bottle top remover. Pulleys, levers and gears are all mechanisms or simple machines.

force 	Causes an object to start or stop moving, slow down or change direction.
gravity 	The force that pulls everything to Earth.
air and water resistance 	Contact forces that act between moving surfaces: the object through air/water or air/water moving over an object.
friction 	The resistance that one surface or object encounters when moving over another.
mechanisms 	A device that allows a small force to be increased to a larger force. Pulleys, levers and gears are all mechanisms.